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Surgical Management of Cutaneous Melanocytic Nevi: Clinicopathological Findings and Outcomes from a Tertiary Plastic Surgery Center in Baghdad, Iraq

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الإدارة الجراحية للوحمات الجلدية: النتائج السريرية والمرضية من مركز جراحة التجميل في مدينة الطب، بغداد، العراق

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Abstract:
It was a prospective, single-centered observational study of 320 patients who had cutaneous pigmented moles that underwent surgery at Ghazi Al-Hariri Hospital of Surgical Specialties, Baghdad Medical City, during the period between January 2022 and December 2023. The handheld polarized dermoscopy and ABCDE dermoscopic criteria were used together to make the preoperative assessment. WHO Skin Tumour Classification (5th edition, 2022) was used to assess the histopathology. Extended the follow-up to 12 months. The histopathology showed 278 benign nevi (86.9) and 42 premalignant or malignant lesions (36 dysplastic nevi, 6 melanoma (4 in situ, 2 invasive). The main anatomical location was the face (41.3%), and the next was the trunk (30.6%). The preoperative clinical -dermoscopic evaluation had a general concordance percentage of 89.4 with histopathology, sensitivity of 85.7 percent in the malignancy detection and specificity percentage of 97.1. Primary closure on an elliptical excision was done in 94.1 percent of cases. In 5.6% of patients there were postoperative complications which were mostly superficial infections and hypertrophic scarring. In 12-month follow-up, one case of invasive melanoma was registered. Cosmetic patient satisfaction was more than 82%. These results suggest that a combination of structured clinical assessment and dermoscopy and histopathological confirmation allows safe and effective excision of moles in a resource-constrained Iraqi context, and aids in the development of national guidelines on the management of pigmented lesions.

Keywords: Melanocytic nevus; cutaneous mole excision; dermoscopy; dysplastic nevus; cutaneous melanoma; plastic surgery; histopathology; Baghdad; Iraq.

الملخص

أُجريت هذه الدراسة المستقبلية الاستعراضية أحادية المركز على 320 مريضاً خضعوا لاستئصال الوحمات الجلدية الصباغية في مستشفى غازي الحريري للتخصصات الجراحية بمدينة الطب ببغداد، خلال الفترة من يناير 2022 حتى ديسمبر 2023. شمل التقييم قبل الجراحة معايير ABCDE والتنظير الجلدي بالمنظار المحوري المحمول. وقد أجرى الفحص النسيجي اثنان من أطباء الأمراض الجلدية وفق تصنيف منظمة الصحة العالمية لأورام الجلد (الطبعة الخامسة 2022). أظهرت النتائج أن 278 آفة (86.9%) كانت وحمات حميدة، فيما صُنِّفت 42 آفة (13.1%) على أنها قبل سرطانية أو خبيثة، شملت 36 وحمة خلالية و6 حالات ميلانوما. استُخدم التشريح البيضاوي مع الإغلاق الأولي في 94.1% من الحالات. بلغت نسبة المضاعفات 5.6%، وسُجّلت حالة انتكاس واحدة عند متابعة 12 شهراً. تكشف النتائج أن الاستئصال الجراحي للوحمات يُعدّ آمناً وفعالاً ضمن البيئة العراقية محدودة الموارد عند تطبيق بروتوكول تشخيصي منهجي.

الكلمات المفتاحية: الوحمة الميلانوسيتية؛ استئصال الوحمات الجلدية؛ التنظير الجلدي؛ الوحمة الخلالية؛ الميلانوما الجلدية؛ جراحة التجميل؛ علم الأنسجة المرضية؛ بغداد؛ العراق.

1. Introduction

Moles, also known as the cutaneous melanocytic nevi, are harmless growths of melanocytes that normally appear in the period when the person is in childhood and continue to grow until when the person is old. Epidemiological evidence indicates that the majority of adults have a range of 10-40 such lesions with the variation controlled by genetic background, exposure to ultraviolet (UV) radiation and skin phototype [1]. Although the vast majority of nevi exhibit a stable, benign course in the course of life, a smaller group acquire an architectural or cytological abnormality altogether as dysplastic nevi that are found to be independent risk factors in addition to phenotypic predictors of melanoma predisposition [2].

Despite being the least common of all skin cancer, which are basal cell and squamous cell carcinomas, melanoma contributes the major percentage of global skin cancer related mortality due to its high metastatic capacity when diagnosed at its advanced stages [3]. The trends of global surveillance on melanoma have steadily reported increase in the cases of melanoma over the past decades, which is due to the cumulative UV exposure, altered recreational patterns, and improved case determination in certain areas [4]. The national data on cancer registries have not been completed in Iraq, but there are evidences of increasing burden of cutaneous malignancies in the country due to excessive outdoor UV radiation, low levels of dermatological knowledge among common people, and late onset of seeking healthcare services [5].

The differentiation between benign pigmented nevi and either atypical or malignant lesions is a well-established diagnosis problem especially in the medical system where dermatological knowledge and sophisticated imaging devices like reflectance confocal microscopy are not easily accessible. Such situations often involve the use of plastic and general surgeons as the initial assessor of pigmented skin lesions particularly in cosmetically sensitive areas of the body such as face, neck and hands. The quality of these clinicians in using the structured clinical criteria, the evaluation of dermoscopic appearance, and adequate surgical judgment thus has a direct impact on oncological safety and patient-reported aesthetic outcome.

The dermatological and plastic surgical care in Iraq is mainly centralized in the large urban centers, and Baghdad Medical City is the national academic and clinical center. In this complex, there is Ghazi Al-Harir Hospital of Surgical Specialties as a tertiary referral centre of surgical and aesthetic operations, which attract patients in central and southern Iraq. Despite the fact that significant number of excisions of cutaneous lesions are carried out each year in this institution, there has been no prospective data published to date describing the

clinicopathological spectrum, surgical management plan and follow up results of excisions of these moles in an Iraqi center.

The current research was aimed at filling this evidence gap with the following specific objectives: (1) to present the demographic and clinicopathological picture of patients with surgical excision of the mole; (2) to calculate the level of concordance between the results of the clinical and dermoscopic examination and the final histopathological diagnosis; and (3) to report the surgical strategy, peri-operative comorbidity rates, recurrence, and cosmetic results within 12 months of observation. The results are meant to guide the local practice, develop an evidence-based case in supporting the provision of more diagnostic infrastructure, and add to the overall body of literature on the treatment of pigmented lesions in populations with Fitzpatrick III-IV skin phototypes [6].

2. Materials and Methods

2.1 Study Design and Ethical Considerations

A potential, single-centre, observational, cohort study was undertaken in a 24-month period (1 January 2022 -31 December 2023) at the Department of Plastic and Reconstructive Surgery, Ghazi Al-Hariri Hospital of Surgical Specialties, Baghdad Medical City, Iraq, a tertiary referral organization, with a population of over eight million residents of central Iraq and a catchment area population of more than eight million, under the jurisdiction of the Ministry of Health and College of Medicine, University of Bag

The study protocol was reviewed and approved independently by the Institutional Review Board of Baghdad Medical City (Reference No.: BMCH-IRB-2022-014) and implemented in accordance with the principles formulated in the updated version of the Declaration of Helsinki (2013). Informed consent was signed by all adult participants; in the case of patients under the age of 18 years, the informed consent was signed by a parent or any other legally authorised person. The study period ensured data confidentiality by anonymising and storing the data in encrypted electronic repositories.

2.2 Population and Eligibility of the study.

The eligibility of all patients who attended the outpatient plastic surgery office with the complaint of cutaneous pigmented lesions needing surgical resection to provide a clear diagnosis, cosmetic betterment or clinical concern as to the likelihood of malignancy. Inclusion criteria: age: above 12 years; clinically significant melanocytic nevus or suspicious pigmented lesion; willing to have the lesion excised surgically; and willing to follow up at 12 months, ascertained by signed informed consent. Participants were left out if they had a history of systemic immunosuppression (including HIV, organ transplantation, or chronic corticosteroid use); an active cutaneous infection at site of lesion; prior biopsy or partial excision elsewhere; incapability to adhere to follow-ups; or lesion was clinically attributed to non-melanocytic aetiology (e.g. seborrhoeic keratosis, dermatofibroma) without diagnostic uncertainty.

Among 342 patients initially screened 22 were eliminated because of an incomplete follow-up or failing to meet the criteria of eligibility, with 320 patients remaining as the final analytic cohort to provide a single excised lesion each to avoid any intrapatient clustering bias.

Preoperative Clinical Assessment The patient reports no allergies to any medications or substances and denies any drug use or allergic reactions to penicillin or asthmatics.

Every patient had undergone an acceptable preoperative assessment by a senior plastic surgery resident or consultant, including: an organised dermatological history (duration of lesions, change of size, colour or contour, related symptoms such as pruritus or haemorrhage, personal or familial history of skin cancer, occupational UV exposure), systematic application of the ABCDE clinical criteria (Asymmetry, Border irregularity, Colour variegation, Diameter >6 mm, Evolution), dermoscopic observation using a Heine Delta 20 handheld polarised d

According to the combined results each lesion was given a preoperative clinical classification benign, atypical/suspicious, or strongly suspicious of melanoma.

2.4 Surgical Technique

The outpatient minor operating theatre was used to carry out all the procedures under local anaesthesia (2% lidocaine with 1:100,000 epinephrine) to reduce interoperator differences. Clinical suspicion excision margins were set to 1-2 mm lesions which were deemed to be benign and 5-10 mm lesions which were suspected and considered atypical or highly suspicious. Relaxed skin tension lines were used as an incision orientation with a No. 15 scalpel blade. Deep closure used 4-0 polyglactin (Vicryl) absorbable sutures and skin closure was done with 5-0 or 6-0 non-absorbable nylon sutures (Ethilon, Johnson & Johnson). Samples were immediately put in labeled formalin containers, and shipped to the Department of Histopathology, Baghdad Medical City, within two hours of excision. Multidisciplinary discussion of small (diameter <4 mm) lesions meant that they were punched or shave excised.

2.5.1 Histopathological Examination.

Independent assessment was conducted by two board-certified dermatopathologists who had more than ten years of experience in relevant fields and were not told the results of the other. All specimens were stained with hematoxylin and eosin, (H&E); immunohistochemical panels (S-100, HMB-45, Melan-A) were done where there was a suspicion in diagnosis. The classification of lesions was based on the World Health Organization Classification of Skin Tumours, Fifth Edition (2022) as: intradermal, compound, or junctional benign melanocytic nevi; dysplastic (atypical) nevi; melanoma in situ; invasive melanoma (with recorded Breslow thickness and Clark level); other entity (e.g. Spitz nevus, blue nevus). A senior third pathologist adjudicated on interpretive discrepancies.

2.6 Postoperative Management and Follow-Up.

Every patient was given a standardised written postoperative care: maintenance of the wound with dry dressing within 48 hours, topical mupirocin 2 percent ointment three times per day, and no direct exposure to sun in the area of the operative site during at least three months. Sutures that could not be absorbed were also taken out at seven to ten days. The scheduled follow-up visits were one week (wound inspection and suture removal), one month (early healing and complication assessment), six months (scar evaluation), and twelve months (final assessment of recurrence, functional outcome, and patient-reported cosmetic satisfaction, on a validated five-point Likert scale, with a score of very dissatisfied to very satisfied). Recurrence, by any clinical indication, such as repigmentation, nodule, or scar ulcer, led to re-examination of the dermoscopic image and re-excision.

The variables and data collection will be as follows.

The data were entered in structured case report forms and all variables stored within a password-protected database on the Microsoft Excel. The recorded variables were patient demographics (age, sex, Fitzpatrick skin phototype); lesion characteristics (location, size in millimetres, ABCDE, dermoscopic findings); operative variables (method, width of margins, method of closure, operative time); histopathological variables (diagnosis, Breslow thickness of melanoma, margin status); and clinical outcome (postoperative complications, recurrence, patient satisfaction score).

2.8 Statistical Analysis

IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY) was used to do the statistical analysis. Categorical variables were depicted as absolute frequencies and percentages, mean (SD) was used to depict the continuous variables, median (IQR) was used to depict the non-normal distributions. Pearson Chi square or Fisher exact test was used to test associations between categorical variables (e.g., clinical suspicion versus histopathological diagnosis) as required. Independent-samples t-tests were used to test differences between-groups characteristics of continuous variables (mean age of benign and malignant groups). The

diagnostic accuracy indices, including sensitivity, specificity, positive predictive value, as well as negative predictive value were obtained when taking histopathology as a reference standard. The level of statistical significance was set at $p < 0.05$(two tailed).

3. Results

3.1 Patient Demographics

The last group consisted of 320 patients with all of them having gone through the 12 months follow up. The average age was 34.2 years old (12-76 years). The proportion of female patients was 56.9 (182) and that of male patients was 43.1 (138). The Fitzpatrick skin phototype of all respondents was like Fitzpatrick skin phototype III (60.0, n = 192) or IV (40.0, n = 128) which is in line with the melanin distribution of the Iraqi population (Table 1).

Table 1. Demographic and baseline clinical profile of the 320 patients who underwent surgical mole excision at Ghazi Al-Hariri Hospital, Baghdad (January 2022 – December 2023).

Patient Demographic Profile (n = 320)		
Characteristic	**Category**	**Frequency, n (%)**
Age (years)	Mean ± SD	34.2 ± 12.7
	Range (min – max)	12 – 76
Sex	Female	182 (56.9%)
	Male	138 (43.1%)
Fitzpatrick Skin Phototype	Type III	192 (60.0%)
	Type IV	128 (40.0%)

SD = standard deviation. Age is reported as mean ± SD; sex and skin phototype as count and column percentage.

3.2 Anatomical Distribution of Lesions

It was found that the face was the most common part to be affected (41.3, n = 132), then the trunk (30.6, n = 98) and the upper and lower limbs (23.8, n = 76), and finally the scalp or neck (4.4, n = 14) (Table 2). The presence of facial lesions was overrepresented among the female patients, and cosmetic concerns were usually mentioned by them as the key stimulating factor in referral.

Table 2. Anatomical distribution of the 320 excised moles across major body regions, with notation of predominant sex by site.

Anatomical Distribution of Excised Lesions			
Body Region	**Cases (n)**	**Proportion (%)**	**Predominant Sex**
Face	132	41.3	Female (cosmetic intent)
Trunk	98	30.6	Male (UV-exposed occupations)
Upper & Lower Limbs	76	23.8	Mixed
Scalp / Neck	14	4.4	Mixed
Total	**320**	**100.0**	—

3.3 Histopathological Findings

Out of the 320 excised lesions, 278 (86.9) were diagnosed as benign melanocytic nevi: intradermal (n = 142, 44.4%), compound (n = 96, 30.0%), and junctional (n = 40, 12.5) lesions. The other 42 lesions (13.1%) were defined as premalignant or malignant including 36

dysplastic (atypical) nevi (8.8%), 4 melanomas in situ (1.3%), and 2 invasive melanoma (0.6), with Breslow thicknesses of 0.8 mm and 1.2 mm, respectively. Eight lesions (2.5) were classified as other diagnoses such as Spitz and blue nevi (Table 3).

Table 3. Hierarchical histopathological classification of all 320 excised cutaneous lesions, grouped by biological behaviour and categorised per WHO Skin Tumour Classification (5th ed., 2022).

Histopathological Classification of Excised Lesions (n = 320)				
Behaviour	**Pathological Diagnosis**	**WHO Subtype**	**n**	**%**
GROUP A – Benign Melanocytic Nevi (n = 278; 86.9%)				
Benign	Intradermal Nevus	IEN	142	44.4
Benign	Compound Nevus	CN	96	30.0
Benign	Junctional Nevus	JN	40	12.5
GROUP B – Premalignant / Malignant Lesions (n = 42; 13.1%)				
Pre-malignant	Dysplastic (Atypical) Nevus	DN	36	11.3
Malignant	Melanoma in situ	MIS	4	1.3
Malignant	Invasive Melanoma	IM	2	0.6
GROUP C – Other Diagnoses (n = 8; 2.5%)				
Other	Spitz / Blue Nevus	SN / BN	8	2.5
—	**Total**	—	**320**	**100.0**

Classification per WHO Classification of Skin Tumours, 5th Edition (2022). IEN = intradermal nevus; CN = compound nevus; JN = junctional nevus; DN = dysplastic nevus; MIS = melanoma in situ; IM = invasive melanoma; SN = Spitz nevus; BN = blue nevus.

3.4 Diagnostic Concordance

There was a total agreement in concordance between preoperative clinical-dermoscopic classification and definitive histopathology at 89.4%. Out of 290 lesions that were found to be of clinically benign appearance, 272 (93.8) were proven to be benign histologically, and 18 (6.2) were upgraded to atypical or malignant. On the other hand, out of 30 clinically suspicious lesions, 24 (80.0) were dysplastic or malignant on pathology, and 6 (20.0) were re-classified as benign (e.g., traumatised intradermal nevi with reactive pigmentation). The sensitivity of clinical evaluation in the identification of malignancy was 85.7% (36/42) and specificity 97.1% (270/278) (Table 4).

Table 4. Full diagnostic performance evaluation of preoperative clinical–dermoscopic assessment relative to histopathological diagnosis, including confusion matrix and derived accuracy metrics.

Diagnostic Performance of Preoperative Clinical–Dermoscopic Assessment vs. Histopathology				
Section A – Confusion Matrix				
Preoperative Assessment	**Histo: Benign**	**Histo: Malignant**	**Row Total**	**Row %**
Clinically Benign	272 (TP)	18 (FN)	290	90.6%
Clinically Suspicious	6 (FP)	24 (TN)	30	9.4%
Column Total	**278**	**42**	**320**	**100%**
Section B – Diagnostic Accuracy Metrics				
Metric	**Formula**	**Calculated Value**		**95% CI (est.)**

Sensitivity	*TP/(TP+FN)*	**85.7%**	73.8–93.6%
Specificity	*TN/(TN+FP)*	**97.1%**	94.5–98.7%
Positive Predictive Value	*TP/(TP+FP)*	**80.0%**	67.0–89.6%
Negative Predictive Value	*TN/(TN+FN)*	**93.8%**	90.3–96.2%
Overall Concordance	*(TP+TN)/N*	**89.4%**	85.3–92.7%

TP = true positive (correctly identified benign); FN = false negative (benign on clinical assessment, malignant on histopathology); FP = false positive (suspicious on clinical, benign on histopathology); TN = true negative (correctly identified malignant). Reference standard: histopathology. CI = confidence interval (estimated Wilson method).

Diagnostic Accuracy Summary: Overall concordance rate 89.4%; Sensitivity for malignancy 85.7%; Specificity 97.1%.

3.5 Surgical Techniques and Margin Management

The most common approach, which was elliptical excision with primary closure, was applied in 301 cases (94.1%). Its popularity had an ability to match it with relaxed skin tension lines, which maximised cosmetic effects, especially on the face. Small, flat lesions less than 4 mm diameter used punch excision in 12 cases (3.8%), and shave excision was only used in 7 cases (2.2%) because the lesions were diagnostic sampling awaiting formal histopathological confirmation (Table 5). The overall lesion diameter was 5.4 + 2.1 mm; the average lesion size in benign cases was 4.9 + 1.8 mm and 8.7 + 2.3 mm in malignant cases (p = 0.001). The mean excision margin of benign lesions was 1.6 mm and suspicious lesions or malignant lesion was 6.3 mm, with all confirmed cases of melanoma re-excised to 5 mm clear margins that were in agreement with the international guidelines.

Table 5. Surgical techniques employed for mole excision: frequency, primary clinical indication, and mean lesion diameter by operative approach.

Surgical Techniques: Frequency, Indications, and Lesion Dimensions				
Operative Technique	**Primary Clinical Indication**	**n**	**% of Total**	**Mean Diameter (mm)**
Elliptical Excision + Primary Closure	All sizes; cosmetically sensitive sites	301	94.1	5.4 ± 2.1
Punch Excision	Small flat lesions (< 4 mm); low clinical suspicion	12	3.8	2.9 ± 0.7
Shave Excision (Diagnostic Sampling)	Pedunculated / raised lesions; pending histopathology	7	2.2	3.2 ± 0.9
Total	—	**320**	**100.0**	—

Data expressed as n (count), percentage of cohort, and mean ± SD (lesion diameter). Elliptical excisions were orientated along relaxed skin tension lines in all facial cases. Shave excisions were performed only after multidisciplinary team discussion.

3.6 Postoperative Complications

It was observed that 18 patients had postoperative complications (5.6). The most common complication was surgical site infections (n = 7, 2.2%), all of them superficial and responding to oral antibiotics with no necessity of hospitalisation. Dehiscence of the wounds was reported in 4 (1.3) patients and was mostly in the high-tension areas, including the back and shoulder. Hypertrophic scarring occurred in 5 patients (1.6) and keloid in 2 patients (0.6) with the latter group having a history of a keloid tendency of their own or family. There were no reported permanent nerve injury and functional deficit (Table 6).

Table 6. Type, incidence, typical onset timing, and clinical management of postoperative complications observed during the 12-month surveillance period.

Postoperative Complications: Incidence, Timing, and Clinical Management (12-Month Follow-Up)				
Complication	**n**	**% (of 320)**	**Typical Onset**	**Management**
Superficial Surgical Site Infection	7	2.2	Days 5 – 10	Oral antibiotics; no hospitalisation required
Wound Dehiscence	4	1.3	Days 7 – 14	Re-closure or secondary healing; predominantly back/shoulder sites
Hypertrophic Scarring	5	1.6	Months 2 – 4	Silicone sheeting; intralesional triamcinolone if persistent
Keloid Formation	2	0.6	Months 3 – 6	Intralesional triamcinolone ± pressure therapy; personal/family keloid history noted
Total Complications	**18**	**5.6**	—	—

No cases of permanent neurological deficit, deep infection, or haematoma requiring operative intervention were recorded. All infections were superficial and responded to conservative outpatient management.

3.7 Recurrence and Cosmetic Outcomes

The 278 patients with benign nevi did not show any recurrence at the 12-month follow up. In patients with premalignant lesions or those exhibiting malignant lesions, only one recurrence was experienced, i.e. a patient of invasive melanoma (Breslow 1.2 mm) who suffered local recurrence at the site of excision at 10 months, which was confirmed histologically and followed up with wide local re-excision and sentinel lymph node mapping. This provided a 12-month recurrence free rate of 99.7 in the whole cohort. Cosmetic satisfaction was also favourable in patients up to 12 months: 82.5% of participants reported the highest level of satisfaction with incisions made in the natural skin creases or in the hair-border regions.

4. Discussion

As far as we know, the present study is the first prospective institutional study of the outcomes of surgical mole excision in an Iraqi plastic surgery centre indicating that with a properly structured and resource-adequate approach, the diagnostic accuracy, low morbidity, and

satisfactorily oncological and aesthetic outcomes can be the same as the results in international facilities that have well-resourced facilities.

4.1 Diagnostic Performance

The overall concordance of 89.4% between the preoperative clinical-dermoscopic evaluation and histopathology proves the usefulness of using the ABCDE rule with handheld dermoscopy with a trained surgical team, which does not have access to advanced imaging. These values are consistent with the reported sensitivity ranges in high-income environments, in which dermoscopy-aided clinical evaluation has shown melanoma sensitivity of about 8095% and melanoma specificity of 7097% [1]. A sensitivity of 85.7 and specificity of 97.1 demonstrate that although melanoma detection is strong in our practice, false-negative (18 cases of lesions that were in the form of pigmented lesions but with histological changes classified as atypical or malignant lesions) confirm the fact that any changing or persistent pigmented lesion must be removed instead of being followed. Particularly, within our cohort of six melanomas, they were all identified in patients who either had evolution (criterion E), or asymmetry and border irregularity (criteria A/B), which confirmed the persistent clinical applicability of the latter parameters to the Iraqi population.

4.2 Epidemiological and Anatomical Observation.

Our cohort of mostly facial lesions (41.3%) is indicative of two effects: one cultural, where face appearance is of paramount importance in the Iraqi society and induces patients to seek clinical help earlier on to trim their molest, and two, the face acquires an unproportionate amount of UV exposure in a hot out-in-the-field environment. This is in contrast with Western European and North American cohorts which portray truncal lesions especially in the male counterparts [3]. This low median age (34.2 years) relative to melanoma registries in Europe and North America (median diagnosis >55 years) could be indicative of an early exposure to UV or genetic predisposition of the Iraqi people or a propensity to develop a more advanced form of the disease due to late specialist referral [4]. These findings highlight the importance of encouraging UV-protective behaviours such as the use of broad-spectrum sunscreens and broad-brimmed headwear in particular situations (which are peak hours of UV irradiation; 10:0016:00).

4.3 Surgical Complications and Conclusions.

The overall complication rate of 5.6% which has included minor dehiscence, superficial infection and scarring is favourable as compared to those published by specialised plastic surgery units internationally [5]. This is due to the compliance with elliptical excision along the skin tension lines (94.1% of cases), layered closure and standardised postoperative wound care guidelines and the non inclusion of immunocompromised cases in the cohort. The fact that there was only one case of invasive melanoma (Breslow 1.2 mm) is probably evidence of poor initial margin evaluation of a lesion that was not suspected of malignancy at the time of surgery. The case demonstrates the usefulness of intraoperative frozen section analysis or staged excision in high-suspicion lesions- a service that is currently not offered in our centre but all clinically suspicious lesions are now sent to multidisciplinary oncological planning.

4.4 Healthcare System Background and Constraints.

It is crucial to place these results in the context of the healthcare system in Iraq. Irrespective of having millions of patients under their care, Baghdad Medical City experiences the chronic shortage of dermatopathology, the average turnaround time of 10-14 days on biopsy requests, and lack of sentinel lymph node biopsy and systemic immunotherapy of advanced melanoma. However, our results prove that decent results can be attained with the help of the clinical care, accuracy in the surgery, and effective patient routes even in the conditions when cutting-edge technology is not available.

The lack of the national skin cancer registry in Iraq [6] is also a serious obstacle to the population level surveillance and early diagnosis. Iraq does not have a standardised reporting

system of cutaneous malignancies unlike neighbouring countries which have been implementing a national melanoma registry (ex: Saudi Arabia in 2018). The information that this research produces may be used as a prototype of such an initiative.

The main weaknesses of the study are the single-centre nature that limits its generalisability to other rural or underserved areas; the limited presence of confirmed melanoma cases (n = 6), which does not allow strong survival analysis; the lack of long-term follow-up or the possibility to segment the results by the subspecialty of the surgery, as the vast majority of the facial excisions in this institution were performed by plastic surgeons (n = 6).

4.5 Clinical and Policy Recommendations.

According to our experience, we would recommend the following practice and policy interventions: (1) inclusion of basic dermoscopy training as part of Iraqi surgery and dermatology residency programmes; (2) creation of national clinical guidelines standardising the role of the excision margins of the mole and their referral pathways; (3) introduction of a public skin self-examination campaign tailored to Iraqi culture and Fitzpatrick III and Fitzpatrick IV skin phototypes; and (4) on the one hand, centralisation of the provincial skin pathology referral network to enhance

5.Conclusion

The findings of this prospective research prove that cutaneous melanocytic nevi excision surgery is safe, effective, and oncologically acceptable at Ghazi Al-Hariri Hospital. The combination of systematic clinical assessment, dermoscopy, and histopathological identification was associated with high diagnostic precision and low rates of morbidity, which showed that it is possible to aim at global quality standards even in a resource-limited Iraqi environment. Dermoscopy training, standardised excision procedures, and early skin cancer awareness initiatives will play a critical role in the process of enhancing population-level outcomes and Iraq keeps on rebuilding its health facility.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

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